

REMARKS

Claims 1-4 are pending in the present application. Reconsideration and withdrawal of the present rejections in view of the comments presented herein are respectfully requested.

Obviousness-type double patenting rejection

Claims 1-4 were provisionally rejected on the ground of non-statutory obviousness-type double patenting as being unpatentable over claims 1 and 4 of commonly owned copending Application No. 10/560,155 in view of Pfeifer (U.S. 3,207,725).

The Examiner alleges that claims 1 and 4 of 10/560,155 and Pfeifer et al. are generally related to analogous salts of alkali metal(s) and ammonium(s) of alkyl diphenyl ether sulfonic acid(s), and that it is known in the art to use alkali metal(s) and/or ammonium salts in combination(s) or alternative(s). However, the developer compositions recited in claims 1 and 4 of Application No. 10/560,155, as amended on April 17, 2007, include a halogen ion in an amount of 1,000 ppm or less. In contrast, the developer compositions of the present claims do not include a halogen ion. Thus, any combination of claims 1 and 4 of 10/560,155 and Pfeifer would result in a developer composition containing halogen ions which are not recited in the present claims.

The Examiner states that “there is no suggestion of compounds with n being 2 in the general formula in the cited paragraph” (Pfeifer at col. 2, lines 7-43. However, this paragraph does indeed teach the following compounds in which n=2: monododecyl diphenyl ether disodium sulfonate, didocecyll diphenyl ether disodium sulfonate, mono- and di-nonyl diphenyl ether disodium sulfonates, and mono- and di-pentadecyl ether disodium sulfonates (Col. 2, lines 40-43).

The Examiner also contends that “there is also no suggestion of an additional compound or dyeable polyolefin composition in Pfeifer.” Copending Application No. 10/560,155 is related to a developer composition used in the field of semiconductors comprising an organic quaternary ammonium base as the main component. In contrast, Pfeifer is related to a dyeable polyolefin composition comprising a polyolefin as a main component. Thus, a person of ordinary skill in the art seeking to modify a developer composition for use in the semiconductor field as disclosed in 10/560,155 would not be motivated by Pfeifer, which is in a completely different technical field, to use the claimed alkali metal developer compositions.

Contrary to the Examiner's assertion, one of ordinary skill in the art would not have applied the metal-containing anionic surfactant taught in Pfeifer to the developer composition of Application No. 10/560,155 because there would be no expected benefit for doing so. As discussed in Applicants' previous response, a developer composition in the field of semiconductors contains no metallic element which contaminates the semiconductor devices (see column 1, lines 24-29 of Sato et al.; column 1, lines 48-62 of Tanaka et al. ('525); and column 1, lines 50-64 of Tanaka et al. ('126)).

The benefit of the metal-containing anionic surfactant taught by Pfeifer is efficient dyeability of polyolefins (see Pfeifer, col. 4, lines 24-28). However, such a benefit is completely unnecessary for a developer composition in the field of semiconductors. Moreover, Pfeifer neither teaches nor suggests the unexpected advantages of a metal-containing anionic surfactant (i.e., improvement in dissolution rate of a resist, dimensional controllability of a resist pattern, etc.) when used in a developer composition for a semiconductor.

In view of the deleterious effects of metallic elements on semiconductors (contamination of semiconductor devices), one of ordinary skill in the art would not have risked using the metal-containing anionic surfactant taught in Pfeifer for the reasonable expectation of obtaining an additional benefit thereof (i.e., efficient dyeability of polyolefins), which is completely unnecessary for a developer composition in the field of semiconductors.

In view of the comments provided above, Applicants respectfully request reconsideration and withdrawal of the obviousness-type double patenting rejection.

Rejection under 35 U.S.C. 103(a)

Claims 1-4 were rejected under 35 U.S.C. 103(a) as being obvious over Sato et al. (U.S. 5,985,525) in view of Pfeifer (U.S. 3,207,725). The Examiner alleges that it would have been obvious to include an alkali metal salt of an alkyl diphenyl ether sulfonic acid for reasonable expectation of obtaining an additional benefit of an analogous anionic surfactant in the art and/or to use an alkali metal salt(s) in place of an ammonium salt(s) in alkyl diphenyl ether sulfonic acid(s). However, as explained below, this combination of references would not render the claimed invention obvious.

The Examiner's assertion that the use of a non-metallic charge or a metallic charge is a matter of choice finds no basis in fact. As argued in connection with the provisional obviousness-type double patenting rejection, a developer composition in the field of

semiconductors contains no metallic element which contaminates the semiconductor devices. In contrast, the benefit of a metal-containing anionic surfactant as taught in Pfeifer is efficient dyeability of a polyolefin. Such a benefit is completely unnecessary for a developer composition in the field of semiconductors. Therefore, in view of the teachings of Sato (and Tanaka), a metal-containing anionic surfactant cannot serve as a second choice (or, for that matter, any choice) for use in the claimed developer composition.

In addition, the Examiner's assertion that the working examples of the present specification shows no critical evidence for a patentability of the claims as broadly disclosed over the applied set of the references is incorrect. As explained below, Table 1 at page 15 of the present specification clearly shows unexpected results associated with the claimed developer compositions. These unexpected results strongly support the nonobviousness of the instant claims.

In Table 1, the relative dissolution time indicates the dissolution rate (developing sensitivity). More specifically, the relative dissolution is a value relative to the time required to remove a pattern having a fixed thickness and a fixed area (1 cm in length × 1 cm in width × 20 µm in thickness) when the anionic surfactant is not added, wherein this relative time is defined as 1.00. (see specification at page 14, lines 7-10). Thus, anionic surfactants with lower relative dissolution times have higher dissolution rates which are more desirable. Moreover, the dimensional controllability is evaluated in accordance with the criteria "A" (Excellent), "B" (Good) and "C" (Poor) as described at page 14, lines 11-18 of the specification.

The anionic surfactants used in Examples 4, 9 and 10 have the same structure, with the exception of the alkali metal which is **Na** (Example 4), **K** (Example 9) and **Ca** (Example 10) (Table 1). The anionic surfactant shown in Comparative Example 1 has the same structure as that used in Examples 4, 9, and 10, except that the metal group is replaced with an **ammonium** group. As evidenced by Table 1, the relative dissolution time of the alkali metal-containing surfactant in Examples 4, 9 and 10 is lower than the corresponding ammonium-based surfactant in Comparative Example 1, meaning that the dissolution rate (developing sensitivity) is unexpectedly significantly improved when a metal-containing anionic surfactant is used, compared to the dissolution rate obtained when a non-metallic (ammonium) anionic surfactant is used. Moreover, Examples 11 to 15, in which anionic surfactants having the same structure as that used in Example 4 are used, demonstrate that the excellent effects of the present invention

(i.e., high resolution rate and excellent dimensional controllability) can be achieved even when the amount of anionic surfactant or the film thickness is changed.

The Examiner states that “an allowed claim or patent would have no value when someone shows that there is a less result, the same result, obviously the same result for the use of the second best metallic element and its charge than those of a non-metallic element and its charge as disclosed, taught and suggested by by Sato et al.” The present application clearly provides unexpected results for the claimed alkali metal-containing anionic surfactants when the allegedly “second best” choice of surfactants (e.g., alkali metal-containing surfactants) are used in the claimed developer compositions.

In view of the comments presented above, Applicants respectfully request reconsideration and withdrawal of the rejection under 35 U.S.C. 103(a).

Tanaka et al. (U.S. 5,543,268) and Tanaka et al. (U.S. 6,329,126)

The Examiner alleged that Tanaka et al. (U.S. 5,543,268) and Tanaka et al. (U.S. 6,329,126) have about the same teachings and suggestions as those in Sato et al. and are therefore cumulative. Thus, for the reasons discussed above in regard to Sato et al., neither of the Tanaka et al. patents in combination with Pfeifer would render the claimed invention obvious.

CONCLUSION

Applicants submit that all claims are in condition for allowance. Should there be any questions concerning this application, the Examiner is respectfully invited to contact the undersigned at the telephone number appearing below.

Respectfully submitted,

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Dated:

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